

# इंटरनेट

# मानक

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IS 12448-5-2 (1989): Basic testing procedures and measuring methods for electromechanical components for electronic equipment, Part 5: Impact tests (Free components), static load tests (Fixed components), endurance tests and overload tests, Section 2: Static load test (fixed [LITD 3: Electromechanical COmponents and Mechanical Structures for



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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*Indian Standard*

**BASIC TESTING PROCEDURE AND  
MEASURING METHODS FOR  
ELECTROMECHANICAL COMPONENTS  
FOR ELECTRONIC EQUIPMENT**

**PART 5 IMPACT TESTS ( FREE COMPONENTS ), STATIC LOAD TESTS  
( FIXED COMPONENTS ), ENDURANCE TESTS AND OVERLOAD TESTS**

**Section 2 Static Load Tests ( Fixed Components )**

**भारतीय मानक**

**इलेक्ट्रॉनी उपस्कर के विद्युत यांत्रिक घटकों की आधारभूत परीक्षण  
प्रक्रियाएं और मापन पद्धतियां**

**भाग 5 संघट्ट परीक्षण ( मुक्त घटक ), स्थैतिक भार परीक्षण ( स्थिर घटक ),  
सह्यता परीक्षण और अधिभार परीक्षण**

**अनुभाग 2 स्थैतिक भार परीक्षण ( स्थिर घटक )**

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**BUREAU OF INDIAN STANDARDS  
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NEW DELHI 110002**

## FOREWORD

This Indian Standard ( Part 5/Sec 2 ) was adopted by the Bureau of Indian Standards on 23 March 1989, after the draft finalized by the Electromechanical Components for Electronic Equipment Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

The object of this standard is to lay down a standard test method to assess the suitability of fixed components for use in applications where these may be subjected to transverse stresses.

This standard ( Part 5/Sec 2 ) is based, without any technical change on IEC Pub 512-5 ( 1977 ) 'Electromechanical components for electronic equipment; Basic testing procedures and measuring methods: Part 5: Impact tests ( free components ), static load tests ( fixed components ), endurance tests and overload tests; 512-5A ( 1980 ), 512-5B ( 1981 ) and Amendment No. 1 to 512-5A, issued by the International Electrotechnical Commission ( IEC ).

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values ( *revised* )'.

*Indian Standard*

# BASIC TESTING PROCEDURE AND MEASURING METHODS FOR ELECTROMECHANICAL COMPONENTS FOR ELECTRONIC EQUIPMENT

## PART 5 IMPACT TESTS ( FREE COMPONENTS ), STATIC LOAD TESTS ( FIXED COMPONENTS ), ENDURANCE TESTS AND OVERLOAD TESTS

### Section 2 Static Load Tests ( Fixed Components )

#### 1 SCOPE

1.1 This standard ( Part 5/Sec 2 ) covers static load tests for fixed components, namely, static load ( transverse ), static load ( axial ) and robustness of activating lever.

#### 2 TEST 8a: STATIC LOAD ( TRANSVERSE )

##### 2.0 General

The object of this test is to detail a standard test method to assess the suitability of a fixed component for use in applications where it may be subjected to transverse stresses.

##### 2.1 Preparation of the Specimen

The specimen shall not be wired but shall be fitted with such accessories as may be required by the detail specification.

Unless otherwise specified, the specimen shall be mounted in the normal manner, using the normal panel or chassis cut-out as laid down in the detail specification.

NOTE — The plate shall be strong enough to sustain the applied forces. The length and width of the plate shall be such that the contour of the specimen is exceeded.

##### 2.2 Test Method

A specified force shall be applied to the specimen at the point and in the direction(s) as specified in the detail specification. This force shall be steadily increased up to the specified value and maintained for 1 min. The force shall be parallel to the mounting plate.

##### 2.3 Final Measurements

- a) Visual examination ( Test 1a ),
- b) Applicable operational characteristics, and
- c) Sealing ( Test 14 ), if applicable.

#### 2.4 Requirements

There shall be no damage which would impair normal operation.

#### 2.5 Details to be Specified

When this test is required by the detail specification, the following details shall be given:

- a) Mounting of the specimen, including dimensions of the panel cut-out;
- b) Type of accessories, if required;
- c) Value of force;
- d) Location, direction(s), and rate and duration of application of the force;
- e) Shape of the fixture or tool for the application of the force;
- f) Requirements for final measurements; and
- g) Any variation from the standard test methods.

#### 3 TEST 8b: STATIC LOAD ( AXIAL )

##### 3.0 General

The object of this test is to detail a standard test method to determine the ability of a component to withstand a steady axial force which might occur during normal use.

##### 3.1 Preparation of the Specimen

The specimen shall be rigidly mounted on a metal plate using its normal fixing device. The dimensions ( length and width ) of the mounting plate shall be such that the contour of the specimen is exceeded.

##### 3.2 Test Method

A specified force shall be applied to the specimen at the point and in the direction(s) as specified in the detail specification. This force shall be steadily increased up to the specified value and

maintained for a specified period. The force shall be perpendicular to the mounting plate.

### 3.3 Final Measurements

- Visual examination ( Test 1a ),
- Applicable operational characteristics, and
- Sealing ( Test 14 ), if applicable.

### 3.4 Requirements

There shall be no damage which would impair normal operation.

### 3.5 Details to be Specified

When this test is required by the detail specification, the following details shall be given:

- Mounting of the specimen, including dimensions of the panel cut-out;
- Type of accessories, if required;
- Shape of the fixture or tool for the application of the force; if necessary;
- Force to be applied, point of application, direction(s), rate of increase of the force and duration of application;
- Final measurements to be applied; and
- Any deviation from the standard test method.

## 4 TEST 8c: ROBUSTNESS OF ACTUATING LEVER

### 4.0 General

The object of this test is to detail a standard test method to assess the robustness of the actuating lever of a toggle switch or a connector release mechanism.

### 4.1 Preparation of the Specimen

The specimen shall be rigidly mounted on a metal plate using its normal fixing device. The dimensions ( length and width ) of the mounting plate shall be such that the contour of the specimen is exceeded.

### 4.2 Test Method

#### 4.2.1 Force

A specified force shall be applied for 1 min at the tip of the actuating lever. The force shall be applied in each of the following directions ( see Fig. 1 )

- Perpendicular to the lever axis and in the plane of lever travel and at each end position of the lever (  $F_{a1}$  and  $F_{a2}$  ),
- Perpendicular to the lever axis and perpendicular to the plane of lever travel at each position of the lever (  $F_{b1}$  and  $F_{b2}$  ),
- Axially with the lever axis towards the lever pivot, (  $F_c$  ) and

- Axially with the lever axis away from the lever pivot (  $F_d$  ).

The force shall be steadily increased at a rate of approximately 20 N/s up to the specified value and maintained for 1 min.

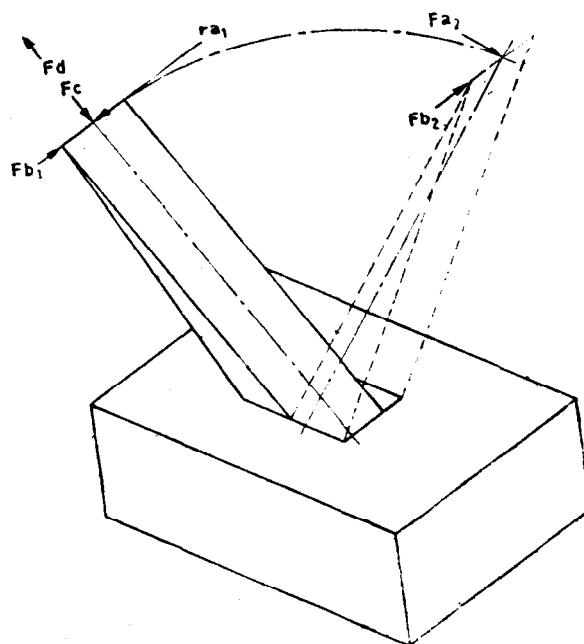


FIG. 1 DETAILS OF FORCE APPLICATION

#### 4.2.2 Torque

A specified torque shall be applied around the axis of the lever in either direction for 1 min.

### 4.3 Final Measurements

- Visual examination ( Test 1a ),
- Operational characteristics, and
- Sealing ( Test 14 ), if applicable.

### 4.4 Requirements

There shall be no damage which would impair normal operation.

### 4.5 Details to be Specified

When this test is required by the detail specification, the following details shall be given:

- Mounting details, including dimensions of the panel cut-out;
- Shape of the fixture or tool for application of the force/torque;
- Force/torque to be applied, direction and rate of application;
- Requirements for final measurements; and
- Any deviation from the standard test method.

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